Indiana State Department of Health

LABORATORIES

Laboratory Services 2000

Indiana State Department of Health
Laboratories
635 North Barnhill Drive, Room #2031
Indianapolis IN
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www.state.in.us/doh/

INDIANA STATE DEPARTMENT OF HEALTH LABORATORIES

LABORATORY SERVICES MANUAL 2000

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Preamble

The State Public Health Laboratory has four major roles. These roles are carried out by the combined efforts of city-county, state, and federal public health laboratories and are directed toward prevention. These roles are the following:

(1) Specialized testing to provide services and laboratory examinations **not performed** by private laboratories in the State. Analytical services must be confined to reference specimens and those of a true public health nature.

(2) Support of public health activities. To provide laboratory testing for programs such as: epidemiology (gathering and monitoring morbidity/mortality data), communicable diseases (technical support for disease outbreaks), environmental health (surveillance for health hazards in the environment), chronic diseases, public health nursing, and occupational health.

(3) Improving laboratory performance in the state through training, establishment of standards, licensure/certification, evaluation (proficiency testing), and providing laboratory consultative services when needed or arranging for their provision.

(4) Research and Development. Applied research into developing more specific and sensitive tests, checking reagent quality, testing new products, etc. Research and development of new testing protocols/programs.

The state laboratory must maintain flexibility in its organization equal to the rate of change in the community, meeting new situations and solving emerging problems. Therefore, the services offered by the state lab will not remain static but will change periodically (new testing offered - old testing eliminated).

Since many of our present test services are widely available in the private sector, selected tests are restricted to state institutions, not-for-profit public health clinics, and local health departments. If you have any questions regarding testing acceptability of your specimen, please call for assistance before submission.

This document is available for viewing and/or downloading from the ISDH World Wide Web page, *http://www.state.in.us/doh/*.

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I. INTRODUCTION TO THE MICROBIOLOGY LABORATORY

The Indiana State Department of Health (ISDH) Laboratories, Microbiology Laboratory offers a wide variety of analyses to the citizens of Indiana which are available through all physicians, hospitals, clinics, and governmental agencies throughout the state. Selected test services, which are widely available in the private sector, may be restricted to state institutions, non-profit public health clinics, and local health departments. The laboratory is comprised of four laboratories: Clinical Microbiology/Rabies, Virology/Immunology, Environmental Microbiology and Consumer Health Microbiology.

CONTACTS FOR THE MICROBIOLOGY LABORATORY

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Clinical Microbiology/Rabies Laboratory..... 317/233-8036
Enteric/Parasitic Infections Laboratory
Mycobacteriology/Mycology Laboratory
Special/Reference Bacteriology Laboratory
Syphilis Serology/Rabies Laboratory

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Virology/Immunology Laboratory..... 317/233-8050
Virology Laboratory
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Retroviral Laboratory
Childhood Blood Lead Laboratory

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Environmental Microbiology 317/233-8084
All calls regarding the submission of samples for microbiological examinations and requests for technical assistance.

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Dairy
Microbiology/Microanalytical

Mary Robinson, Microbiology Laboratory Certification Officer
mrobinso@labs.isdh.state.in.us
Drinking Water Microbiology Laboratory Certification 317/233-8072

FOODBORNE ILLNESS TELEPHONE CONTACTS AT THE INDIANA STATE DEPARTMENT OF HEALTH

Food Protection Program — Lee Bray, Training Officer - 233-7364
Shirley Vargas, Consumer Specialist - 233-7718

Communicable Disease Division: Pam Pontones, Epidemiologist - 233-7009

Laboratory: (not for initial reporting)
Reba Stuckey, Food Laboratory - 233-8013
David Dotson, Virology - 233-8050
Ron Sanderson, Microbiology -233-8036
FAX - 233-8063
Containers Section - 233-8104

ISDH 24-Hour Emergency Number: Duty Officer - 233-8115; if busy 233-8117 or 233-1325

Questions concerning status of a specimen or results should be directed to one of the following numbers:

Microbiology/Rabies 317/233-8036
Virology/Immunology 317/233-8050

CLINICAL MICROBIOLOGY/RABIES LABORATORY

The **Enteric/Parasitology Laboratory** performs reference laboratory services to aid in the identification of enteric organisms submitted by laboratories throughout the state. This laboratory offers services to isolate, identify, and/or confirm *Salmonella sp., Shigella sp., Campylobacter sp.,* and *E. coli O157:H7,* among others, from clinical specimens. (Complete serotyping of *Salmonella sp.* and *Shigella sp.* is provided). Approved clients may also receive complete examination of paired formalin and polyvinyl alcohol (PVA) preserved stool specimens for intestinal parasites. Blood preparations for parasites are sent to the CDC for examination.

The **Mycobacteriology/Mycology Laboratory** offers identification services pertaining to all approved clinical, reference, and environmental isolates. Since most environmental samples are considered unique, approval prior to submission is necessary. Approval may be obtained through the laboratory supervisor at (317) 233-8036.

The Mycobacteriology activity offers direct microscopic and cultural examination of clinical specimens for primary identification, and Bactec, biochemical, genetic probe, and HPLC techniques for speciation. Drug susceptibility testing is routinely performed on all **new** cases of *M. tuberculosis.* Drug susceptibility testing for treatment effectiveness will be performed automatically after culture positive for three months or upon specific written request for isolates of *M. tuberculosis*. Susceptibility testing for other mycobacterial species must be discussed with the TB lab supervisor. Call (317)233-8042 or 233-8036 for any consultation.

The **Special/Reference Bacteriology Laboratory** offers the identification of pure reference cultures of all clinical bacterial isolates and provides services for the isolation and identification of microorganisms from approved human and environmental sources. A Hewlett Packard gas-liquid chromatograph is utilized for both preliminary and definitive identification of most of the isolates.

The **Rabies/Syphilis Serology Laboratory** performs rabies testing on a daily basis. A complete description of how to submit specimens for rabies testing can be found on page 5. Results are usually available 24 hours after submission if the head is not frozen. Heads submitted on late Friday afternoon are held until Monday morning for testing unless consultation indicates that a **real** emergency exists. The specimen will then be tested on Saturday and the results telephoned to the submitter or responsible party.

Syphilis serology is performed routinely. Any serum that is weakly reactive or reactive in the VDRL test is automatically tested using the MHA and FTA specific tests. Any serum that is submitted specifically for FTA evaluation is tested regardless of the VDRL result. The State of Indiana does not require a premarital syphilis serology.

VIROLOGY/IMMUNOLOGY LABORATORY

The **Virology Laboratory** examines human clinical samples for the presence of viral, chlamydial, and gonorrheal agents. Reference viral cultures are accepted for verification and subtyping of viruses such as influenza, enterovirus, and adenovirus.

The **Immunology Laboratory** performs various serological techniques often requiring paired acute and convalescent sera to identify specific antibodies to disease causing agents. The agents examined include selected viral, parasitic, bacterial, or fungal agents. Complement fixation, hemagglutination inhibition, enzyme

immunoassay, and indirect fluorescent antibody are examples of the different types of tests utilized in this laboratory.

In the **Retrovirology Laboratory**, serum is examined for infection by Human Immunodeficiency Virus (HIV), utilizing EIA and Western Blot assays.

LABORATORY REPORTING

Copies of laboratory reports will be mailed only to the source indicated on the request form. The laboratory will not produce a separate mailing to acknowledge specimen receipt. Reports, however, will be released as pertinent information becomes available. For example, specimens positive for *M. tuberculosis* may have three separate reports issued: i.e., microscopic findings, culture identification, and drug susceptibility results. Due to the confidential nature of patient information, some results may not be given over the telephone.

SPECIMEN REQUIREMENTS FOR THE MICROBIOLOGY LABORATORY

1. Serology Specimens

Serological specimens should be collected without preservatives. Approximately 3 ml of serum should be separated using aseptic techniques and placed into a plastic sterile screw capped, leak proof vial. Paired sera may be required for testing. The acute phase serum should be collected shortly after disease onset and held frozen until collection of the convalescent serum 2 to 4 weeks post onset. Both sera should be labeled with the patient name and respective collection dates, and sent to the laboratory accompanied by the completed test request form. A four-fold or greater titer rise is usually considered confirmation of a recent infection with that agent. When an acute serum is not obtainable, an early convalescent and a later convalescent serum collected 7 or more days after the first serum may prove useful. Under these circumstances, a four-fold or greater drop in titer is usually considered diagnostically significant.

Serological analysis is performed on cerebrospinal fluid (CSF) in special circumstances such as Subacute Sclerosing Panencephalitis (SSPE) or encephalitis. A serum specimen collected at the same time must always be submitted and tested along with the CSF. Send both specimens to the laboratory promptly after their collection. These are special circumstances and require prior consultation with the laboratory (317) 233-8050.

Single serum testing is performed in certain circumstances such as screening for infection with the Human Immunodeficiency Virus (HIV), hepatitis, syphilis, encephalitis, mycotic or parasitic agents or when IgM testing is available.

2. Viral Isolation

Specimens for virus isolation should be collected during the acute febrile phase of illness. Each specimen should be labeled with the patient name, collection date, and sample type. They should be submitted to the laboratory in leakproof containers using double containment techniques and sent refrigerated. Specimens, with the exception of those for RSV or CMV, may be quick frozen and shipped on dry ice if transit will take more than 48 hours. Swabs, such as eye, stool, nasopharyngeal, throat, or vesicular specimens, should be placed into leak proof containers of commercially available viral transport media. The nature of the illness will dictate the specimen of choice as follows:

Swabs: Calcium alginate swabs should be avoided as they may interfere with viral recovery. Cotton swabs or their equivalent should be used.

Stool: Samples of approximately walnut size should be collected and placed into a leakproof container.

Throat specimens: A vigorous swab of the palates, tonsils, or pharyngeal wall should be placed into a leakproof container with viral transport media. Nasopharyngeal aspirates should be placed into a leakproof container with viral transport media.

Vesicular lesion: Scrapings or a vigorous swab should include epithelial cells from the base and perimeter of a relatively fresh vesicle. These should be put into a leakproof tube containing viral transport media. Avoid using calcium alginate swabs.

Spinal fluid: At least 2 ml of CSF should be collected aseptically and placed into a leakproof container.

Urine: A fresh, "clean catch" urine is the specimen of choice for cytomegalovirus (CMV). With the exception of CMV and the mumps virus, urine is not considered useful for most other viruses.

Autopsy specimens: Each autopsy/biopsy specimen must be collected separately using aseptic technique. It is critical that these specimens be placed into separate and clearly labeled leakproof containers.

3. Bacteriology Specimens

Generally, only specimens of human origin are accepted for bacterial testing. Non-human and environmental specimens may be tested by prior arrangement if it can be determined they are of public health significance. For all shipped specimens, transit time should not exceed 48 hours, particularly if the sample was not collected aseptically. The type of organism suspected will influence the collection of specimens as follows:

Enteric bacteriology: Fecal specimens should be collected as early in the course of enteric disease as possible and prior to commencement of antimicrobial therapy. Anal swabs are of little value. Institutions without laboratory support and local health departments may submit feces or urine for testing. Pure cultures may be referred from any laboratory for identification or confirmation.

Mycobacteriology: Sputum, bronchial washings, pleural fluid, spinal fluid, tissues and purulent fluid are appropriate specimens for mycobacterial analysis. Pure cultures for identification, confirmation, or drug susceptibility testing may be referred from any laboratory.

Legionella sp: Sputum, bronchial washings, and biopsy material are acceptable specimens for Legionella testing. Urine may be used for antigen detection. Please call (317) 233-8060 or (317) 233-8050 before sending.

Cultures: Pure cultures are required; however, mixed cultures may be accepted by special arrangement (317) 233-8040. Cultures should be grown on freshly prepared medium, free from excessive moisture. For anaerobes, use stab cultures in a low carbohydrate medium or sealed chopped meat broth. For bacteria with poor shipping tolerance, send a relatively heavy (18-24 hr) growth on a blood agar slant, heart infusion slant, or other enriched medium slant. Do NOT submit cultures on petri dishes or selective media slants. Mycobacterial cultures should be submitted on a tube slant of mycobacterial culture medium, preferably Lowenstein-Jensen.

Chlamydia/Gonorrhea: Specimens should be obtained from the female cervix, male urethra or conjunctiva using the GenProbe Pace specimen collection kit.

4. Mycology

For routine mycology examinations, only specimens of human origin are accepted. Environmental and animal specimens are tested by prior arrangement if they are of a public health significance (317) 233-8036. The following specimens are acceptable for testing: spinal fluid, sputum, and body fluids. Feces and urine are accepted with prior consultation only. Skin scrapings, nails, hair, and other similar clinical material are unacceptable specimens.

Cultures: Mycology cultures should be submitted on firm agar slants in screw-capped tubes. Media that contain antibiotics should be avoided. Do NOT submit mycology cultures on petri dishes. They will not be processed.

5. Parasitology

Only specimens of human origin are accepted for parasite testing. Non-human specimens are tested by prior arrangement if they are of a public health significance (317)233-8036. Two types of specimens are acceptable: feces and blood. The feces should be divided into 2 aliquots, one portion in 10% formalin and the other in polyvinyl alcohol (PVA) fixative solution. Whole blood treated with an anti-clotting agent, preferably EDTA, or duplicate slides of both thick and thin unstained blood smears are necessary for blood parasite examinations. For optimal results, the blood smears should be prepared immediately after venipuncture, properly labeled, submitted dry, unmounted and unstained. Clotted blood is not a satisfactory specimen. Blood specimens for malaria are usually sent to the Centers for Disease Control in Atlanta, Georgia for testing.

Feces Collection Guidelines:

At least three normally passed stool specimens should be submitted for examination and should be collected at 2 to 3 day intervals.
Do not use mineral oil, bismuth, or magnesia compounds for purgation.
Do not collect samples for 7-10 days following barium or bismuth treatment.
Do not collect samples until 2-3 weeks following any antibiotic treatment.
Do not collect samples immediately following the use of either anti-diarrheal or antacid compounds.
Do not allow specimens to freeze.
Do not allow urine or water to mix with fecal samples.
Do not delay collection due to an acute intestinal disturbance. Collect any blood/mucus or diarrheal specimens.

6. Rabies

INSTRUCTIONS FOR THE SUBMISSION OF ANIMAL HEADS AND BATS FOR RABIES TESTING

Specimens

Since brain tissue is examined in the diagnosis of rabies, submit only the animal's head for diagnostic purposes. For bats, the whole dead animal should be submitted. Animals must be euthanized in a manner that will not destroy the brain. The animal's neck should then be severed at the mid-point between the base of the skull and the shoulders for shipment as follows.

Packaging of Specimens

Place the animal specimens for rabies diagnosis in a leakproof container (jar, can, double plastic bag, etc.) and seal. Place this container in a shipping carton (use Styrofoam if possible) and enclose a refrigerant to keep the specimen cold. Canned ice makes an ideal refrigerant and eliminates the problem of the refrigerant leaking from the shipping container. Specimens should be kept cold but preferably not frozen. DO NOT USE LOOSE WET ICE. Freezing the head will delay testing since it takes up to 24 hours to thaw.

Completion of Form

The upper sections (No. 1 thru 6) of the submission form must be filled out. The form should be sealed in a separate plastic bag and enclosed with the specimen. An incomplete form may result in the delay of conveying vital information to the person or persons exposed. The form for rabies head/bat submission is included at the end of this publication.

EMERGENCY SITUATIONS DEFINED

The State Health Department laboratory personnel perform routine rabies testing on animal heads Monday through Friday, excluding holidays. All animal heads received at our location by 2:30 PM will be tested that day. Those received after that time will be tested the following day. Animal heads received after 2:30 PM Friday afternoon, Saturday or Sunday are kept refrigerated until the next normal working day, at which time they are promptly tested.

The majority of bites and/or scratches that are inflicted to humans by animals are not an immediate rabies threat to the wounded individual. Rabies virus, if present, progresses slowly along nerves and does not become systemic. If the biting/scratching animal proved to be rabid, immunization of the patient would be initiated resulting in immunity. Any short term delay in testing caused by holidays or weekends would be negligible with respect to treatment.

IMMUNIZED ANIMALS

Any bite or scratch inflicted by a dog or cat with proof of current immunization, regardless of the wound location on the body, will not be considered a rabies emergency. If, however, the victim was brutally attacked and mauled about the shoulders, head, and neck with extensive tissue damage, the animal would be tested on an emergency basis regardless of its immunization status.

NON IMMUNIZED DOMESTIC ANIMALS

Any bite or scratch inflicted on or above the neck by a dog or cat without proof of immunization will be considered a rabies emergency. If the attack occurred below the neck and was brutal as described above, the attack will be considered an emergency and the brain will be examined within 24 hours after receipt of the animal head.

Household pets such as mice, hamsters, ferrets, rats, etc. are considered low priority for rabies transmission and bites/scratches will not be considered an emergency regardless of the bite location on the body.

WILD ANIMALS

Bites/scratches from wild carnivorous animals, especially skunks, bats, raccoons, coyotes, and foxes, are the most disturbing because rabies is found most often in those wild animals. In Indiana rabies has been observed most often in bats and occasionally in skunks. Bites/ scratches on the neck, head, or face will be treated as an emergency situation and the brain will be examined within 24 hours after receipt of the animal head. If the attack occurred below the neck but was brutal as described above, the attack will be considered an emergency and the brain will be examined within 24 hours after receipt of the animal head. For prophylaxis, physicians have the option to immediately administer the first dose of rabies vaccine to the victim before the laboratory result is known.

Bites/scratches from wild mice, rats, chipmunks, and squirrels are not considered to be high priority transmission vectors for rabies and are not a rabies threat to the victim. However, due to the probable emotional nature of the situation, such bites/scratches inflicted on or above the neck will be tested within the 24 hour time-frame described above.

NOTE

DO NOT FREEZE THE HEADS submitted for rabies testing. The 24 hour test time window for emergency situations could be extended for 12 hours or more to allow time for thawing.

ETIOLOGIC AND CLINICAL SPECIMEN MAILING CONTAINERS

Clinical specimens which are not packaged appropriately may not be accepted for testing. Appropriate shipping containers are available for every type of specimen routinely tested in our laboratory. Those containers are designed for the shipment of etiologic agents and clinical specimens via the U.S. Postal Service. This policy applies equally to specimens sent by private courier, parcel service, or hand delivered by other authorized personnel.

Specimens mailed to the Indiana State Department of Health are received and transported to the laboratory specimen receiving area. Specimens brought in by courier should be directed to the laboratory specimen receiving area on the second floor, south wing, room #MS2023. Initial handling of such mail within the

agency is done by non-technical staff. Likewise, postal personnel are not trained in the handling of infectious material; therefore, we must insist that cultures and specimens which are potentially infectious be transported to the laboratory in fully approved intact mailing containers. Do NOT submit any specimens in petri dishes.

Samples may also be dropped off at a remote location at the IUPUI Police Headquarters. This drop off is located at 430 University Blvd. and is available 24 hrs/day.

Containers may be obtained by writing the following office:

Container Section
ISDH Laboratories
635 North Barnhill Drive, Room #2031
P O Box 7202
Indianapolis IN 46207-7202

Emergency shipments - Call (317) 233-8104

1	A	-	Human Immunodeficiency Virus (HIV) Antibody - serum
1	B	-	Human Immunodeficiency Virus (HIV) Antibody - whole blood (restricted use*)
2	B	-	FA slides (Pertussis)
4	A	-	Intestinal Parasites
5	A	-	Syphilis Serology
5	B	-	Syphilis Serology - whole blood (restricted use*)
5	D	-	Special Serology (Fungus, Trichinosis, Leptospirosis)
6	A	-	Culture for Tubercule Bacilli
7	A	-	Enteric Infections (Typhoid carrier, etc.)
8	A	-	Mycology Examinations (moist or liquid specimens)
9	A	-	Viral and Rickettsial Serology
9	B	-	Viral Isolation
10	A	-	Reference Culture Container
11	A	-	Hepatitis Antibody - serum only (restricted use**)
11	B	-	Hepatitis Antibody - whole blood (restricted use*)
11	C	-	Perinatal Hepatitis (restricted to program participants)
12	A	-	Legionella
13	A	-	Chlamydia/Gonorrhea

* These containers are designed to hold a 10 ml blood tube. Only those institutions that have prior approval may request these containers. Institutions who wish to obtain these containers should call for authorization (317) 233-8050.

** Only those institutions that have prior approval may request these containers. Institutions who wish to obtain these containers should call for authorization (317) 233-8050.

INSTRUCTIONS FOR PACKING AND SHIPPING SPECIMENS

If at all possible, use the containers provided by the Indiana State Department of Health (317) 233-8104. The preceding page indicates the types of containers available and the packaging size.

1. Print patient's complete name or confidential identifier corresponding with the requisition form, the type of specimen collected, and the date collected on the sample label.

2. **Do Not** use ball-point pens, wax, indelible pencils, or other writing instruments that tend to smear.

3. Enclose a completed request form with **each** properly labeled specimen. Only one requisition is needed for paired (acute and convalescent) serum specimens if packaged in the same container.

4. Enclose the specimen in a screw-cap tube or vial with a tight-fitting cap. Seal the cap with waterproof tape.

5. Package specimens properly for transit (Figure 1) ensuring that personnel who handle the package will not come into contact with the enclosed specimen.

6. Place the tube or vial (primary container) in a watertight secondary container. Pack a suitable absorbent material around the tube to absorb shock and to contain possible leakage. If several tubes are to be packed within the same can, wrap each tube individually in absorbent material. **Do Not** place the request form within the secondary container; wrap it around the outside of the secondary container.

7. Place the secondary container into a shipping container. Seal the outer shipping container securely; affix a properly completed address label with a return address and postage, if required.

8. If specimens must be sent refrigerated or frozen, they should be packaged in an insulated container. The insulated container should be placed within a properly labeled cardboard box and sealed securely. The specimens should be packaged in a manner that prevents movement within the insulated container.

9. Try to time shipments (when possible) to arrive early in the week. Be particularly careful to avoid having the specimen arrive on a weekend or a holiday.

10. **Never** mail any clinical specimens or cultures in petri dishes.

11. Improperly packaged specimens and specimens that have leaked **will not be accepted.**

12. A specimen arriving with an incomplete request form or no request form may be held until the information is received. The proper request form for each specimen submitted must be completed as fully as possible. When possible, include patient name or confidential ID, date of specimen collection, type of specimen, birth date or age, sex, date of onset, diagnosis, symptoms, attending physician, county of residence, suspected agent, reference culture information including type of medium and source of isolate, and other pertinent medical information including contact with insects, animals, etc., antibiotic or anti-tuberculosis therapies, recent vaccinations, similar infections in the family or community, and recent travel including destination and dates.

13. Copies of the reports are mailed only to the source indicated on the request form. **Be sure to include the full 9 digit zip code for each address.**

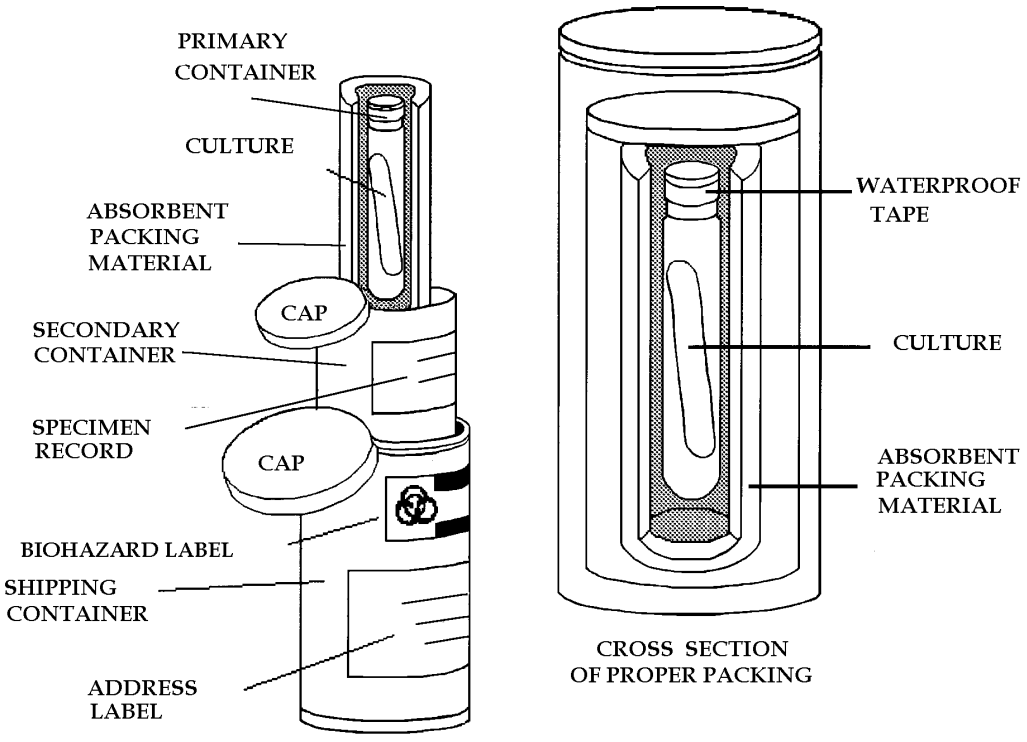

Figure 1 *

* 42 CFR, Part 72

CDC Instructions
Reference & Disease Surveillance
Center for Infectious Diseases, Feb. 1986
Office of Biosafety, Centers for Disease Control
Atlanta GA 30333

SPECIAL REQUIREMENTS FOR BACTERIAL DISEASES

The Indiana State Department of Health encourages submission of pure cultures that **cannot be identified by routine analysis**. It is required that the submitter attempt to identify the organism(s) and that test results be made available to the laboratory as indicated on the submission form.

It is not laboratory policy to accept either environmental or animal specimens on a routine basis. If there is an incident where either is suspected as a causative agent for human illness, contact the laboratory directly for consultation.

The Disease Control Laboratory offers a wide variety of testing services which are available to all physicians, hospitals, clinics and governmental agencies throughout Indiana. Selected test services, which are widely available in the private sector, may be restricted to state institutions, non-profit public health clinics, and local health departments. Serological tests for routine physicals for employment, military, or school entry physicals, are not available. If you have any questions regarding testing acceptability of your specimen, please consult the laboratory at (317) 233-8036 or (317) 233-8050.

BACTERIAL DISEASES

Disease or agent[1]	Identification[2]	Bacterial Grouping/ Typing	Presence of Toxin/ Virulence	Anti-microbial Suscept-ibility	Isola-tion	Antigen Detection	Antibody
Anthrax	X				*		
Anaerobic infections due to:							
Actinomyces sp.	X						
Arachina sp.	X						
Bacteriodes sp.	X						
Clostridium difficile	X		X				
Clostridium perfringens	X		X				
Clostridium tetani	X		*				
Clostridium botulinum	X		*				
Clostridium sp.	X		X				
Cocci-anaerobic	X						
Eubacterium sp.	X						
Fusobacterium sp.	X						
Brucellosis	X	X			*		
Cholera (Vibrio cholerae)	X	X			*		
Diphtheria	X				*		
Corynebacterium	X						
Enteric Bacterial infections due to:							

BACTERIAL DISEASES

Disease or agent[1]	Identification[2]	Bacterial Grouping/ Typing	Presence of Toxin/ Virulence	Anti-microbial Suscept-ibility	Isola-tion	Antigen Detection	Antibody
Aeromonas sp.	X				*		
Campylobacter sp.	X				X		
Pathogenic E. coli	X	X	X		X		
Salmonella typhi	X	X			X		
other Salmonella sp.	X	X			X		
Shigella sp.	X	X			X		
Yersinia sp.	X	X			*		
Gardnerella vaginalis	X						
Gonococcal infections	X[3]	X			X	DFA	
Gram Positive aerobic bacilli	X						
Legionellosis	X				X	DFA, EIA[4]	IFA
Listeriosis	X					DFA	
Meningococcal infection	X	X			X		
Pertussis	X	X			X	DFA	
Pneumococcal infection	X	X					
Pseudomonas infection	X						
Rat Bite Fever (Streptobacillis)	X				*		
Staphylococcal infection	X	X		X			
Streptococcal infection	X	X					
Syphilis							VDRL, [5] FTA
Mycobacteriology	X			X[6]	X		
Tularemia (Francisella tularensis)					*	DFA	
Vibrio sp.	X	X			*		
Other Bacterial Agents							
Alcaligenes	X						
Acinetobacter	X						
Flavobacterium	X						
Haemophilus influenzae	X	X					
Haemophilus ducreyi	X				*		
Haemophilus sp.	X						
Pasteurella sp.	X						
Micrococcus sp.	X						
Other Gram Negative Bacteria	X				*		
Unclassified Bacteria	X						

Abbreviations:

DFA = direct fluorescent antibody
EIA = enzyme immunoassay
FTA-ABS = fluorescent treponemal antibody absorption
VDRL = venereal disease research laboratory slide test

1 Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses.

2 Pure isolates from a human source are required. Animal or environmental isolates are not accepted unless sufficient evidence for public health significance is presented.

3 DNA antigen detection. Restricted acceptance of specimens. Call the Virology Laboratory at 317/233-8065 for submission requirements.

4 EIA antigen detection from urine. Contact the Immunology Laboratory at 317/233-8060 for collection and shipping requirements.

5 VDRL testing is restricted to state institutions, not for profit public health clinics, and local health departments. FTA testing is available to hospital and other laboratories as a reference or confirmation service only.

6 Routine susceptibility testing will be performed upon new patients or written request and is restricted to *M.* tuberculosis. Susceptibility testing for other mycobacteria requires prior consultation and laboratory approval.

* Prior consultation is required before cultures are shipped to the ISDH. Call (317) 233-8040.

SPECIAL REQUIREMENTS FOR MYCOTIC DISEASES

The mycology unit serves as a reference laboratory for the identification of clinically significant fungi. Clinical histories and pure cultures (in screw-capped tubes) are required for complete identification studies.

The Disease Control Laboratory offers a wide variety of testing services which are available to all physicians, hospitals, clinics, and governmental agencies throughout Indiana. Selected test services, which are widely available in the private sector, may be restricted to state institutions, non-profit public health clinics, and local health departments. If you have any questions regarding testing acceptability of your specimen, please consult the laboratory at (317) 233-8036.

MYCOTIC DISEASES

Disease or agent[1]	Culture Identification Morphology/Biochemistry[2]	Serological Studies for Antibodies[3]/Antigens	Exoantigen[4] GenProbe[5]
Aspergillosis	X		
Blastomycosis	X		X[5]
Candidiasis	X		
Chromoblastomycosis	X		
Coccidioidomycosis	X		X[4]
Cryptococcosis	X		
Histoplasmosis	X	ID, CF	X[4]
Keratomycosis	X		
Mycetoma	X		
Nocardiosis	X		
Paracoccidioidomycosis	X		
Penicilliosis	X		
Phaeohyphomycosis	X		
Ringworm	X		
Sporotrichosis	X		
Streptomyces	X		
Torulopsosis	X		
Zygomycosis (Phycomycosis)	X		

Abbreviations:

AGG = agglutination
CF = complement fixation
ID = immunodiffusion

1 Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses. Consultation prior to sampling is required for environmental analyses.

2 Pure cultures required.

3 A serum specimen or CSF of 3 ml is required for testing. CSF specimens must always be accompanied by a serum collected the same day as the CSF.

4 Exoantigen testing for blastomycosis and coccidioidomycosis are done by the Centers for Disease Control (CDC). Completed CDC forms must accompany the sample.

5 GenProbe analysis is used for identification.

SPECIAL REQUIREMENTS FOR PARASITIC DISEASES

The Parasitology unit accepts properly prepared samples for intestinal parasites that are either hand delivered or mailed in 4A containers. Complete instructions are included with the container and should be carefully followed.

If malaria is suspected, prior consultation and arrangements with our laboratory personnel must be made before specimens are delivered to us for examination.

Since many diagnostic parasitic examinations are widely available in the private sector, test services are restricted to state institutions and local health departments. Reference services are still available. If you have any questions regarding whether your specimen is acceptable for testing, please call (317) 233-8036 or 233-8045 for assistance before submission.

PARASITIC DISEASES

Disease or agent[1]	Parasitology Confirm[2] Identification	Serology Studies for Antibodies
Arthropods	X[4]	
Blood parasites[3]	*	
Babesiosis	*	
Chagas disease	*	
Leishmaniasis	*	
Malaria	*	
Trypanosomiasis	*	
Intestinal parasites	X	
Amebiasis	X	
Cryptosporidosis	X	
Giardiasis	X	
Toxoplasmosis	X	
Cyclosporosis	X	

Abbreviations:

1 Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses.

2 Pure isolates from a human source are required; animal or environmental specimens are not accepted unless sufficient evidence of public health significance is presented.

3 Prior consultation is required before submission of specimens.

4 Preserve and transport in 70% ethyl alcohol.

* Submission of thick and thin unstained blood smears in duplicate and whole blood with EDTA is required. For best results, prepare smears immediately after venipuncture.

Some specimens may be sent to the CDC in Atlanta, Georgia for testing.

SPECIAL REQUIREMENTS FOR VIRAL, CHLAMYDIAL, MYCOPLASMA, AND RICKETTSIAL DISEASES

The Virology/Immunology Laboratories offer a wide variety of testing services which are available to all physicians, hospitals, clinics, and governmental agencies throughout Indiana. Selected test services, which are widely available in the private sector, may be restricted to state institutions, non-profit public health clinics, and local health departments. If you have any questions regarding test acceptability of your specimen, please consult the laboratory at (317) 233-8050.

All specimens suspected of containing live viruses may be submitted for viral isolation. Specimens that will be received in the laboratory within 48 hours of collection can be shipped refrigerated on commercially available ice packs in an insulated container. All others must be shipped on dry ice.

Lesion, rectal or throat swabs may be submitted for virus isolation when collected with the proper swab. Use a swab found to be non-detrimental to viruses and placed in viral transport media. **Do not use calcium alginate swabs.**

Cerebrospinal fluids, bronchial washings, stools, autopsy specimens and other such specimens should be submitted in sterile containers with no preservatives or transport media.

Specimens for cytomegalovirus and respiratory syncytial virus should not be frozen. These specimens should be chilled as soon as possible after collection and promptly shipped refrigerated.

Viral isolates referred to the virology laboratory for identification should be accompanied with a complete isolation history. Indicate on the request form the source of the isolate, date of isolation, host system used and passage number of the sample submitted.

For serological diagnosis, acute and convalescent sera are generally required. The acute serum should be drawn as nearly as possible to the date of onset and the convalescent drawn two to four weeks later. The acute serum should be stored frozen until the convalescent is drawn and submitted as paired sera. In some cases a presumptive diagnosis is possible if only a single convalescent serum is available. Refer to page 3, Section 1 for further information on serological specimens. Depending on the test, single acute sera may be acceptable.

Hantavirus submission: Blood and serum

Specimens acceptable for hantavirus testing include serum, whole blood, and fixed or fresh frozen tissue samples. Prior arrangement for testing should be made with the laboratory. Serum or, preferably, whole blood, should be collected in a red top tube. Paired specimens are preferred; single specimens are acceptable. If specimens are collected post-mortem, a heart blood sample is preferable. Sera and blood specimens must be sent at room temperature or with a cold pack. Complete the Hantavirus Pulmonary Syndrome Case Report Form and the Virology Request Form as thoroughly as possible.

Hantavirus submission: Tissue Specimens

The following tissues are acceptable for submission: lymph nodes, heart, spleen, pancreas, pituitary, brain, and liver. Fixed tissue specimens in paraffin blocks or slides or formalin-fixed tissues should be sent at room temperature. DO NOT FREEZE.

Fresh tissues should be sent frozen on dry ice. Complete the Hantavirus Pulmonary Syndrome Case Report Form and the Virology Request Form as thoroughly as possible. If specimens were obtained during autopsy include a copy of the autopsy report.

VIRAL DISEASES

Disease or Agent[1]	Serology	Isolation	Antigen
Arboviruses		Brain tissue, CSF	
California encephalitis	IFA, HI	Brain tissue, serum	
Eastern equine encephalitis	IFA, HI	Brain tissue, serum	
St. Louis encephalitis	IFA, HI	Brain tissue, serum	
Western equine encephalitis	IFA, HI	Brain tissue, serum	
other Arboviruses	HI	Brain tissue, serum	
Enteroviruses			
Coxsackieviruses	CF, NT[2]	Feces, throat washing or swab, spinal fluid, urine, ocular swab, N/P swab, autopsy specimens	
Echoviruses	CF, NT[2]	Feces, throat washing or swab, spinal fluid, urine, ocular swab, N/P swab, autopsy specimens	
Poliovirus 1-3	NT[2]	Feces, throat washing or swab, spinal fluid, urine, ocular swab, N/P swab, autopsy specimens	
Respiratory Viruses			
Adenovirus	CF	Feces, throat washing or swab, urine, conjuctival swab, N/P swab	
Hantavirus	EIA	[3]	[3]
Influenza virus	CF, HI	N/P swab, throat swab or washing	
Mumps virus	IFA	N/P swab, throat swab or washing	
Parainfluenza virus	CF	N/P swab, throat swab or washing	
Respiratory syncytial virus	CF	N/P swab, throat swab or washing	
Herpesvirus			
Cytomegalovirus		Urine (unfrozen), throat washing or swab[4]	
Herpes simplex virus		Vesicular fluid, lesion swab, brain tissue[5]	
Varicella-zoster virus	IFA	Vesicular fluid, lesion swab	
Exanthematous viruses			
Measles (rubeola)	EIA, IFA		
Rubella	EIA		
Parvovirus B19	IFA		
Rabies virus[6]			DFA
Retroviruses			
Human Immunodeficiency Virus 1 (HIV-1)	EIA, WB		
Hepatitis[7]			
Hepatitis A			
anti HAV IgG	EIA		
anti HAV IgM	EIA		
Hepatitis B			

VIRAL DISEASES

Disease or Agent[1]	Serology	Isolation	Antigen
HBsAG			EIA
anti-HBs	EIA		
anti-HBc	EIA		
anti-HBc IgM	EIA		
HBeAG			EIA
anti-HBe	EIA		
Delta Hepatitis			
anti-Delta	EIA		
Hepatitis C			
anti-HCV-	EIA, RIBA		
Viral gastroenteritis			
Rotavirus[7]			EIA

Abbreviations:
CF = Complement fixation
EIA = Enzyme immunoassay
IFA = Indirect fluorescent antibody
WB = Western blot
DFA = Direct fluorescent antibody
HI = Hemagglutination inhibition
NT = Neutralization
RIBA = Recombinant Immunoblot Assay

1 Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses. Specimens for viral isolation should be shipped chilled on ice packs or wet ice if delivery can be made within 48 hours; otherwise, specimens should be frozen and shipped on dry ice.

2 Neutralization tests are performed only when virus is isolated from the patient. Sera for poliovirus may be tested without an isolate; however, contact the laboratory (317/233-8050) before shipping.

3 Services may be provided through prior consultation for isolation, immunohistochemical and PCR testing. Testing is normally performed at the Centers for Disease Control, Atlanta, Georgia.

4 Ship specimens on cold pack or wet ice. **Do not freeze.** Contact the laboratory before shipping.

5 Specimens for genital herpesvirus isolation are restricted to state institutions, not-for-profit public health clinics and local health departments. Reference isolates are accepted for confirmation.

6 Mammal heads submitted for rabies antigen detection should be sent chilled on ice packs or wet ice. For bats, the whole dead animal should be submitted. Tissue specimens of suspected human cases will be accepted with prior consultation before shipping. Special precautions must be taken to insure that leakage will not occur. Specimens should be sealed in a metal container separate from the ice. Do not send rabies specimens on Friday except by carriers who will guarantee delivery that day, i.e., bus lines, taxi, or courier. The Indiana State Department of Health telephone number for emergency rabies testing is 317/233-8115.

7 Services may be provided through prior consultation and for outbreaks of public health significance. Most specimens must be submitted by local health departments or other state agencies.

CHLAMYDIAL DISEASES

Disease or agent[1]	Serology	Antigen
Psittacosis	[1]	
Chlamydia trachomatis		DNA Probe*

Abbreviations:

[1] Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses.

[*] Restricted submission. Call the Virology Laboratory at 317/233-8065 for submission requirements.

MYCOPLASMAL DISEASES

Disease or agent[1]	Serology
Mycoplasma pneumoniae	CF

Abbreviations:

CF = Complement fixation

[1] Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses.

RICKETTSIAL DISEASES

Disease of agent[1]	Serology
Q Fever	IFA
Rickettsia rickettsii	IFA
Rickettsia typhi	IFA
Ehrlichia chaffeensis	IFA

Abbreviations:

IFA = Indirect fluorescent antibody

Other testing or tests for agents not listed may be made by special arrangement. In most cases, paired (acute and convalescent) serum specimens are required for serological diagnoses. Provide complete patient information including travel history.

INDIANA STATE DEPARTMENT OF HEALTH
IN-HOUSE TESTING
TURN-AROUND TIMES

MICROBIOLOGY			
TESTS *			WORKING DAY TURN-AROUND
PARASITOLOGY Ova/Parasites			6
ENTERIC PATHOGENS		Cult.	Spec.
routine	Salmonella	15	15
	Shigella	5	6
	Campylobacter	N/A	6
other	E. coli 0157	9	9
	Vibrio	N/A	10
MYCOLOGY			
routine	Yeasts		12
	Molds		23
other	Air Plates		6
	Environmental		consult lab
MYCOBACTERIOLOGY			
routine	smear slide		1
	(+)clinical spec		5-35 ***
average	(-)clinical spec		30
	pure cultures (TB)		3
	pure cultures (MOTT)		7
	contaminated cultures		consult lab
other	Environmental		consult lab
REFERENCE/SPECIAL BACT.			
routine	culture ID		16
	Pertussis FA		4
	Pertussis ID		12
	Legionella FA		5
	Legionella ID		16
other	Environmental		consult lab
Food Poisoning			12
STD			
Rabies Testing			5
Syphilis Testing			7
HIV Testing			7
Chlamydia Antigen Detectiong			12

* These are maximum turn-around times for the tests listed. In many cases the times will be less than stated, but due to the diversity and complexity of some of the specimens received, some will require longer in-house processing.
*** Time is dependent upon the number of AFB seen on smear slide.

VIROLOGY/IMMUNOLOGY	
TESTS	WORKING DAY TURN-AROUND
IMMUNOLOGY **	
Complement fix.	12
Rubella EIA	5
Toxoplasma EIA	5
Cytomegalovirus EIA	5
Hepatitis EIA	11
Measles IFA	5
Legionella IFA	5
Rickettsia IFA	5
Coxiella IFA	5
Fungal ID	5
Brucella AGG	5
Francisella AGG	5
Cryptococcus AGG	5
Arbovirus (Avian) HI	7
Arbovirus (Human) HI	7
Influenza HI	12
VIROLOGY	
Virus Isolation/Detection	
Herpes Simplex	16
Non-Herpes Simplex	30
Enterovirus	30
Influenza	30
Respiratory Virus	30
Cytomegalovirus (CMV)	30
Varicella Zoster (VZV)	30
Chlamydia	30

** These are minimal turn-around times based as follows:

1. CF test for a given profile are batched.
2. Influenza HI is started after serocomparison by CF.
3. Arbovirus HI is set up twice weekly.
4. Hepatitis B from initial screen through Hbe testing.
5. No batching done except for CF and Arbovirus HI.
6. For HBV screen to give preliminary report - 6 days.

ENVIRONMENTAL MICROBIOLOGY

SAMPLING REQUIREMENTS

All divisions of the ISDH follow written sampling protocols prior to the delivery of samples to the laboratory. Others who may wish to submit samples should be aware of certain requirements.

Microbiological Samples--All samples must be collected in sterile sample bottles that are supplied by the ISDH for the specific type of sample. Forms are specific for the type of submitter and must be filled out as completely as possible and returned with the sample. (Appendix B)

SAMPLE DELIVERY

Microbiological Samples--These samples have a very short holding time and should be delivered to the laboratory as soon as possible. If the samples are to be mailed, sample collection should be correlated with the time of the closest mail pickup. Drinking water samples must reach the laboratory within 30 hours to be valid. They will be examined up to 48 hours old, but will be so noted and evaluated accordingly. An alternate source of shipment other than the U.S. Postal Service may be utilized, such as UPS, bus, or Federal Express.

DRINKING WATER SAMPLES
(Public and Private Water Supplies)

Samples of drinking water submitted by a private individual or a public water supply may be tested for the following parameters:

Microbiological examination - Total coliform and *E. coli:* To determine if the water is bacteriologically safe for drinking purposes.

Sterile sample bottles for the collection of a water sample for a microbiological examination must be obtained from the ISDH. Sample containers for collection of water samples for the determination of sodium, fluoride, nitrite, and nitrate should be obtained from ISDH. If applicable, the $8.00 fee for the analysis must be enclosed with the bottle request. (See Appendix D).

Public water supplies are regulated by IDEM and any information on monitoring/regulatory requirements can be addressed by their staff (317)308-3280. The testing capabilities offered to the public water supplies is the same menu as that for private individuals. There is no fee for the community public water supplies but the fee schedule for non-community water supplies is the same as for private individuals. (See Appendix D).

POOL, BEACH, AND SPA SAMPLES

Pools, beaches, and spas that serve the public are regulated by the ISDH Sanitary Engineering programs and all monitoring inquires should be directed to the staff in this program area (317) 233-7183. There is no fee schedule for samples submitted for this program.

Private samples are analyzed for the same fee as designated for the analysis of private drinking water.

The following examinations are made on swimming pools, bathing beaches, and spas/hot tubs:

Microbiological - Total Coliform, Heterotrophic Plate Count, *E. coli* to determine if the water is bacteriologically safe for recreational purposes.

The sample bottles must be obtained in the same manner as those for the microbiological examination of drinking water. (See Appendix D).

COUNTY HEALTH DEPARTMENT SAMPLES

Microbiology: Sterile sample bottles are supplied free of charge to the local health departments and state institutions for the collection of samples needed to assist the departments in the investigation of public health emergencies or environmental problems. **These free sample bottles are not to be distributed to individuals for the collection of samples from a private water source; however, order forms (Appendix D) may be given to private individuals who are interested in obtaining water tests from the ISDH Environmental Microbiology Laboratory.**

MICROBIOLOGICAL DETERMINATIONS AVAILABLE

Routine:

Total Coliform (P/A--MMO-MUG)
E. coli (P/A--MMO-MUG)
E. coli (MF)
Heterotrophic Plate Count

Upon Request-With Prior Notification to Lab

Total Coliform (MF and MPN/AT-MMO MUG)
Pseudomonas aeruginosa (MPN)
Coliphage

CONSUMER HEALTH MICROBIOLOGY

The Consumer Health Microbiology Section provides laboratory services in the area of food and dairy microbiology and microanalytical expertise in isolating and identifying foreign material and insects in food products. Most of the routine work in this area is in support of investigations of alleged food-borne illness incidents, consumer complaints, and the federally required routine surveillance of dairy products produced in Indiana. These investigations and monitoring programs are conducted for the citizens of Indiana by the Food Protection Division at the Indiana State Department of Health, local health departments, and the Indiana Board of Animal Health.

SPECIAL REQUIREMENTS FOR FOOD, DRUG, AND DAIRY SPECIMENS

All samples submitted for a food, drug, or dairy analysis must be submitted through the Food Protection Division at the Indiana State Department of Health, or the Indiana Board of Animal Health. No specimens will be routinely accepted if sent directly to the laboratory.

If a specimen needs to be analyzed in the Consumer Health Microbiology or Chemistry Sections, contact your local health department sanitarian who will obtain the necessary submission information from either the Food Protection Division of the Indiana State Department of Health or the Dairy Division and/or Meat and Poultry Division of the Indiana Board of Animal Health.

CONSUMER HEALTH MICROBIOLOGY EXAMS

Exams Associated with Foodborne Illness Investigations

Salmonella
Staphylococcus
Clostridium perfringens
Escherichia coli
Total Coliform
Listeria
Bacillus cereus
Vibrio parahaemolyticus
Standard Plate Count
E. coli O157:H7

Other Exams

Yeast and Mold
Tomato Mold Counting
Foreign Material/Filth
Commercial Sterility of Canned Foods
Bioassay for Antibiotics in Meat and Milk
Beta Lactams (Meat and Milk)
Streptomycin (Meat Only)
Tetracyclines (Meat Only)
Other drug residues in milk as official methods become available.

Standards of Identify for Dairy Products

Added Water
Total Moisture
Fat Content
Alkaline Phosphatase (Indicator of Proper Pasteurization)
Total Solids
Acidity
Label & Weight
Leucocytes

CHILDHOOD BLOOD LEAD ANALYSIS LABORATORY

The Childhood Blood Lead Analysis Laboratory (CBLAL) performs blood lead testing on children's whole blood specimens for the Indiana Childhood Lead-Poisoning Prevention Program (ICLPPP) in the Division of Maternal and Child Health (MCH). The CBLAL does initial screening on finger stick blood specimens and verifies elevated blood lead levels from venous blood draws. Blood lead levels are evaluated using a graphite furnace atomic absorption spectrophotometer. The results from each test are recorded by the laboratory and delivered to the ICLPPP in the MCH where they are compiled and mailed to specimen submitters.

SPECIAL REQUIREMENTS FOR BLOOD LEAD TESTING

Methods for collecting blood lead specimens, the proper labeling of specimen tubes and requisitions, and the proper delivery of blood specimens to the ISDH laboratory are taught to specimen submitters by ICLPPP field personnel. Blood lead specimens will be considered unsatisfactory if: 1) the quantity is not sufficient (QNS) to perform testing; 2) the blood is clotted (CLOT) or; 3) the specimen tube contains a specimen other than human whole blood. Specimen testing may be delayed if the requisition that accompanies the specimen(s) contains insufficient or incorrect information.

Submitters who want to use the Childhood Blood Lead Analysis Laboratory (CBLAL) services should contact ICLPPP at the ISDH.

The following individuals serve as contacts for blood lead testing:

Cathy Nordholm, Acting Director, ICLPPP	(317)-233-1232
Pam Kudla, Administrative Assistant ICLPPP	(317) 233-1250
Tom Cronau, Technical Supervisor CBLAL	(317) 233-8008

II. INTRODUCTION TO CHEMISTRY LABORATORY

The Chemistry Laboratory of the Indiana State Department of Health (ISDH) functions as a support unit providing chemical laboratory services required by the Indiana Department of Environmental Management (IDEM), the ISDH Sanitary Engineering Division, the ISDH dental fluoride program, the Food Protection Division and other state institutions. Laboratory services are also provided to local health departments to assist in public health or environmental emergencies or investigations. A private citizen of Indiana may submit a water sample from a private well, swimming pool, or bathing beach to the laboratory for analysis; however, a fee is charged for this service as specified by IC 16-1-26-14. Presently the fee is $8.00.

The Chemistry Laboratory consists of six areas: Inorganic Chemistry, Organic Chemistry, Consumer Health Chemistry, Laboratory Certification, Radiochemistry and Indoor Air, and Clerical Support. The Inorganic Chemistry Branch consists of general, nutrient and trace metal sections, and the Organic Chemistry Branch has gas chromatography (GC) and gas chromatograph/mass spectrometry (GC/MS) sections.

LABORATORY CONTACTS

David E. Nauth, Director
Dnauth@labs.isdh.state.in.us
ISDH Laboratories 317/233-8006

Craig T. Hinshaw, Manager
Chinshaw@labs.isdh.state.in.us
Chemistry Laboratory 317/233-8074

Laboratory Reporting Office 317/233-8078
All calls regarding the results of chemical analyses of drinking water and microbiological examinations of drinking water, swimming pools, or bathing beaches; requests for information on microbiological and fluoride sample bottles.

Bharat Patel, Supervisor
bpatel@labs.isdh.state.in.us
Inorganic Chemistry Branch 317/233-8086
All calls regarding the submission of samples for inorganic chemical analyses and requests for technical assistance.

Robin Bruner, Supervisor
rbruner@labs.isdh.state.in.us
Organic Chemistry Branch 317/233-8080
All calls regarding the submission of samples for organic chemical analyses and requests for technical assistance.

Kenneth Hill, Jr., Supervisor
khill@labs.isdh.state.in.us
Consumer Health Chemistry Section 317/233-8010
Trace Residues
General Chemistry

Ron Clark
Rclark@labs.isdh.state.in.us
Indoor Air Laboratory Branch ……..……317/233-8018
Indoor Air Quality
Suspected and Bulk Asbestos

Jane Smith
Jesmith@labs.isdh.state.in.us

Radiochemistry Laboratory
Radiological analysis of water, milk and other samples

Philip Zillinger, Chemistry Laboratory Certification Officer
pzilling@labs.isdh.state.in.us
Drinking Water Chemistry Laboratory Certification 317/233-8071

After Hours Emergencies 317/233-8115

CHEMISTRY
Environmental Laboratories (Organic and Inorganic)

SAMPLING REQUIREMENTS

All divisions of the ISDH follow written sampling protocols prior to the delivery of samples to the laboratory. Others who may wish to submit samples should be aware of certain requirements.

Samples for Chemical Analysis--Prior to submitting samples, it would be advisable to check with the appropriate Chemistry Section. To obtain a valid sample, certain chemical determinations require that the sample is preserved in some manner at the time of collection, a specific type of bottle is used, certain sampling techniques be applied, and adhered to a specific length of holding time. A written request for analysis must accompany the sample, which identifies the sender, specifies the sample type, and indicates what determinations are desired. (Appendix C)

SAMPLE DELIVERY

Samples for Chemical Analysis--Some types of samples require either refrigeration from the time of collection until their arrival in the laboratory or that a preservative be added. It is advisable to check with the appropriate Chemistry Section prior to the shipment of samples.

DRINKING WATER SAMPLES
(Public and Private Water Supplies)

Samples of drinking water submitted by a private individual or a public water supply may be tested for the following parameters: Determination of sodium, fluoride, nitrite and nitrate: These are respectively important in the consideration of low sodium diets, the prevention of dental caries, and nitrate poisoning in infant feeding.

A fee is charged for the examination of a private water sample as specified by IC 16-1-26-14. For testing a sample of water for a private person, firm, or corporation not offering drinking water, bottled water, or mineral water for sale for public consumption, the ISDH shall charge and collect a fee of eight dollars ($8.00). (See Appendix D).

COUNTY HEALTH DEPARTMENT SAMPLES

Chemical Analysis: Before submitting samples to the laboratory it would be advisable to contact the Chief of the appropriate Chemistry Section because of the reasons specified under "SAMPLING REQUIREMENTS." In addition, it should be ascertained that staff time is available which will permit the analysis of the samples within the desired time frame. A request for <u>any type of test</u> or sample matrix may be submitted to the Chemistry Laboratory. There is <u>no fee</u> charged for any chemical analysis requested by the county health department for their monitoring and investigative purposes.

CHEMICAL DETERMINATIONS AVAILABLE

I. Inorganic:

A. General:

- Acidity
- Alkalinity
- Biochemical Oxygen Demand
- Bromide
- Calcium
- Cation Exchange Capacity
- Chemical Oxygen Demand
- Chloride
- Chlorine Residual
- Cyanide
- Flash Point
- Fluoride
- Hardness
- Magnesium
- Ammonia Nitrogen
- Nitrate Nitrogen
- Nitrite Nitrogen
- Total Nitrogen
- Odor
- Oil & Grease
- pH
- Phenol (Total)
- Phosphorus
- Residues (All)
- Sand Analysis
- Specific Conductance
- Specific Gravity
- Sulfate
- Sulfide
- Surfactants
- Tannin
- Total Organic Carbon
- Turbidity

B. Trace Metals:

- Aluminum
- Antimony
- Arsenic
- Barium
- Boron
- Cadmium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Manganese
- Mercury
- Molybdenum
- Nickel
- Potassium
- Selenium
- Silicon
- Silver
- Sodium
- Strontium
- Thallium
- Tin
- Vanadium
- Zinc

II. Organics:

- Herbicides
- Pesticides
- Miscellaneous
  - Fuel Oil
  - Gasoline
  - Other (Selective)
- Priority Pollutants
  - Volatiles
  - Base Neutrals
  - Acid Fraction
- PCBs
- Trihalomethanes

CONSUMER HEALTH CHEMISTRY

The Consumer Health Chemistry Section provides analytical chemistry laboratory support to principally the Food Protection Division of the Indiana State Department of Health. Through that Division, these laboratory services are also provided to the local health departments, which serve the individual citizens of Indiana. Laboratory assistance is often provided to other state agencies such as Department of Natural Resources, Department of Environmental Management, and the Department of Administration. Most of the routine work involves supporting the investigation of consumer complaints or surveillance programs of meat and dairy products for conformance to state and federal regulations and standards of identity. Also, extensive laboratory support is provided to the Indiana Board of Animal Health.

PHYSICAL AND CHEMICAL EXAMS

The types of physical, chemical, and microbiological examinations that may be performed are listed below. For requests not listed below, federal laboratories are consulted and utilized.

Physical Exams

Organoleptic
Detinning of cans
Visual exam of packaging for signs of tampering
Visual exam of product contents for signs of tampering
Container integrity
pH of sample or sample extract
Forensic criminal examinations (jointly handled by our laboratory, the Indiana State Police laboratory, and the Indiana State Department of Toxicology).

Chemical Exams

Metals in Foods and Beverages
- Lead
- Cadmium
- Zinc
- Copper
- Chromium
- Mercury
- Arsenic
- Tin
- Antimony
- Nickel
- Selenium

Organic Residues in Foods and Beverages
- PCBs
- Pesticides
- Purgeable Organics
- Other Halogenated Hydrocarbons

Miscellaneous Residues in Foods and Beverages
- Aflatoxin in Milk
- Aflatoxin in Corn
- Coumarin in Vanilla
- Safrole in Sassafras Products
- Commercial Glucose in Honey and Maple Syrup

Others (where official method exists and does not require specialized instrumentation, reagents or training/expertise).
Vitamin A and D in Milk

Drug Screening of Pharmaceutical Products, Foods, and Beverages
- Amphetamines
- Barbiturates
- Hypnotics
- Alkaloids
- Acidic Drugs
- Illicit Drugs

GRAS Food Additives/Preservatives
- Sodium Benzoate
- Potassium Sorbate
- Monosodium Glutamate
- Sulfites
- Sodium Nitrite
- Phosphate
- Natural Colors
- Artificial Colors

USDA Approved Meat and Meat Product Tests
- Total Moisture Content
- Added Moisture Content
- Total Protein Content
- Meat Protein Content
- Fat Content
- Salt Content
- Cereal Content
- Non-Fat Dry Milk Content
- Soy-Flour Content
- Corn Syrup Solids Content

Miscellaneous Food and Non-Food Tests for Standards of Identity
- Percent Egg Yolk Solids in Egg Products
- Percent Alcohol in Beverages
- Foreign Fat (Vegetable or Animal)
- U.S.P. Drug Assays

Miscellaneous Tests for Adulterants in Food/Non-Food Products
- Cyanide
- Caustic Materials
- Acidic Materials
- Strychnine
- Extractable Lead from Paint, Pottery, and Pewter Items
- Extractable Cadmium from Imported Glazed Pottery
- Identify Foreign Material

INDOOR AIR LABORATORY

Analysis of industrial hygiene, indoor air quality and bulk asbestos is available from the Indoor Air Laboratory. The Indoor Air Laboratory is responsible for providing analytical laboratory services and sampling consultation to the ISDH, county health departments, the Indiana Department of Labor (OSHA and BUSET) and the public.

The Indoor Air Laboratory currently has the following instrumental resources:

- Atomic absorption spectrophotometry – metal analysis by flame, furnace, hydride generation and cold vapor
- Gas chromatography – organic analysis using packed and capillary columns with flame ionization, electron capture, and mass spectrometer
- Liquid chromatography – organic analysis using ultraviolet detection
- Ion chromatography – inorganic and organic cation analysis using conductivity detection
- X-ray diffraction – crystalline inorganic and organic analysis. Asbestos and crystalline silica determinations. Unknown mixture analysis
- Ultraviolet and visible spectrophotometry – inorganic and organic analysis, especially formaldehyde, chlorine, hexavalent chromium and diisocyanates
- Ion specific potentiometry – various inorganic determinations especially ammonia, cyanide, hydrogen sulfide and fluoride
- Optical microscopy – phase contrast and polarized-light microscopy using dispersion staining. Asbestos analysis of building materials and air samples
- Gravimetric analysis – for air samples especially carbon black, coal tar pitch volatiles, nuisance dust and oil mist

All air sampling media is prepared by Indoor Air Laboratory staff to insure consistency, chain-of-custody and quality. Local health departments can obtain sampling equipment and media from the Indoor Air and Radiological Health Division. If any further information is necessary on sampling equipment or media, call Conrado Cansino or John Ruyack at 317/233-7150.

The following is a partial list of media used:

- Mixed cellulose ester fiber membrane filter
- Teflon membrane filter
- Silver membrane filter
- Glass fiber filter
- Charcoal air sampling tube
- Silica gel air sampling tube
- Tenax air sampling tube
- Chromosorb air sampling tube
- XAD-2 air sampling tube
- Special compound-specific air sampling tube
- Impingers
- Bubblers

The Indoor Air Laboratory accepts samples of building materials, insulation, pipe wrapping, ceiling tile, floor tile, etc. suspected of containing asbestos. Samples should be sent in sealed, double plastic bags and submitted to:

Indoor Air Laboratory
ISDH Laboratories
635 North Barnhill Drive, Room #2031
Indianapolis, Indiana 46202-5021

RADIOCHEMISTRY LABORATORY

Radiological analysis of water, milk and other samples is available in the Radiochemistry Laboratory. If sample analysis is desired or further information is needed concerning sampling instructions and sample preservation, call Jane Smith, 317/233-8015.

LABORATORY REPORTING OFFICE

The reporting office distributes sample reports to the customers, responds to requests for sample report status, and provides information on the ordering of sample kits. It also directs telephone requests or technical information to the appropriate staff. For assistance, call 317/233-8078.

LABORATORY CERTIFICATION

The ISDH Laboratories are responsible for certifying laboratories under the Safe Drinking Water Act. This task includes conducting on-site evaluations plus distributing and evaluating proficiency test samples. Admittance to one of the programs is accomplished by submitting an application to the certification officer at the ISDH Laboratories. Further information may be obtained by calling 317/233-8071 (chemistry testing) or 317/233-8072 (microbiology testing)